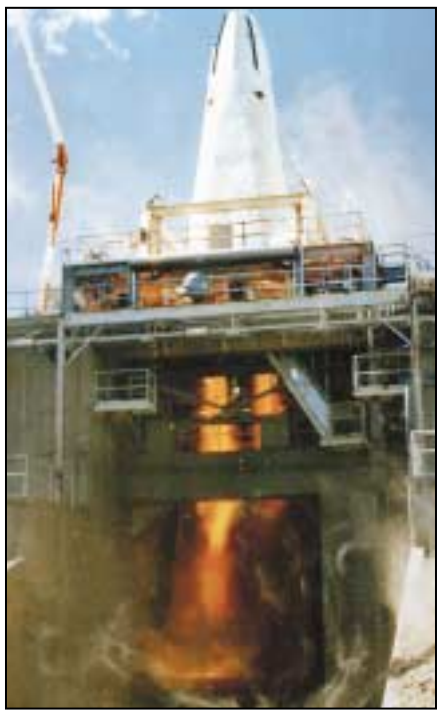
White Sands Test Facility Overview

By Ray Melton

Water-cooled probes measure exhaust characteristics of 100 lbf attitude control thruster.



Static firing of DC-X with 4 LOX/Hydrogen RL10-A5 engines.

Precision-cleaning Viking soil sampler that landed on Mars in 1976.

Nestled in the foothills of the San Andres mountains in southwestern New Mexico, the NASA White Sands Test Facility (WSTF) is a remote component of Johnson Space Center. The facility was constructed early in the Apollo era specifically to conduct tests involving spacecraft rocket propulsion systems, toxic or highly reactive chemicals and potentially hazardous materials that could not safely be performed in more heavily populated areas such as Houston.

The WSTF capabilities for space-simulated vacuum firings of solid and liquid rocket propulsion systems are among the best in the nation. The sophisticated laboratories used for evaluating potentially hazardous materials and components for both Earthly and aerospace applications are similarly outstanding. Although most of the work at WSTF is done for NASA, many other fascinating test projects are conducted for customers such as the U.S. military, other government agencies and private industry.

The people at WSTF test rocket engines, resolve space mission anomalies and investigate new materials and components. They also refurbish Space Shuttle propulsion and life support system components for reflight, design and fabricate spaceflight hardware, and perform tests to validate new components to enhance mission safety and extend the operational life of existing spacecraft systems.

At WSTF, there are some fascinating and unusual jobs, such as:

- Working with special light-gas guns, which can propel 1-inch-diameter projectiles 10 times as fast as a rifle bullet. This simulates the impact of micrometeoroids or orbital debris on components for the International Space Station, Space Shuttle Orbiter or other spacecraft.
- Conducting tests to see how various materials, including metals, burn and how fires propagate in the microgravity environment of space.
- Testing new components that must operate in corrosive or highly reactive environments, such as pure oxygen, where even stainless steels and titanium alloys burn violently.

WSTF also operates the White Sands Space Harbor (WSSH), an alternate orbiter landing site with 7-mile-long laser-leveled pure gypsum runways. The WSSH is where Space Shuttle astronauts are trained to perform the critical final approach and landing phase of the mission, using specially modified aircraft that simulate the response and aerodynamic behavior of the orbiter.

WSSH is equipped to accommodate an Orbiter landing if an emergency should develop in flight, or if adverse weather conditions were to render the primary landing facilities at Kennedy Space Center or Edwards Air Force Base unsuitable.

The current WSTF workforce of about 690 people is comprised of 54 NASA civil service personnel and 633 contractor employees. The installation is certified to the quality management standards of ISO 9001 and ISO 14001 and was declared an OSHA Star site in recognition of its excellent programs dedicated to ensuring workplace safety.

A scientist operates an x-ray photoelectron spectroscopy instrument for molecular analysis of surface effects such as corrosion and contamination.